PRE-FIELD TRIP LESSONS
Lesson 1:
Biodiversity

Samantha Cardines, Francine Silva Pahoa Elementary

Objective: Students will be able to understand what biodiversity is, and why it exists.

Time: about 60 minutes

Materials:

- A science notebook
- Blank Pieces of paper, 1 per child
- pencils
- Standards:

Topic	Cycles of Matter and Energy
Benchmark SC.4.3.1	Explain how simple food chains and food webs can be traced back to plants
Topic	Unity and Diversity
Benchmark SC.4.5.2	Describe the roles of various organisms in the same environment

Speaking and Listening	Comprehension and Collaboration	4.SL.1	Engage effectively in a range of collaborative discussions (one-on-one. in groups, and teacher-led)with diverse partners on grade 4 topics and texts, building on others' ideas and expressing their own clearly. a. Come to discussions prepared. having read or studied required material; explicitly draw on that preparation and other information known about the topic to explore ideas under discussion. b. Follow agreed-upon rules for discussions and carry out assigned roles. c. Pose and respond to specific questions to clarify or follow up on information, and make comments that contribute to the discussion and link to the remarks of others. d. Review the key ideas expressed and explain their own ideas and understanding in light of the discussion.

Anticipatory Set:
Tell students that you will be discussing something that they probably see everyday, but seldom notice. In order to begin the lesson, they are going to start by drawing a picture of various parts of the school. You may select the different parts of the school, or allow them to free draw. Tell them they will have about ten minutes to finish their picture.
After ten minutes, ask students to describe what they see in their pictures, pay special attention to any plant or animal life they have added. (birds, bugs, plants, lichen, etc.)

Purpose: Prepare to become aware of the biodiversity around them.
Explain that the purpose for today's lesson is to become aware of the world around them, especially the life that is around them. Ask them to get into groups with the other students who have drawn that part of the school. Have them look over their illustrations and think about what types of life there are. Are there any animals or plants that they did not draw, but they have seen there. If possible, take the students for a nature walk outside and have them add to their illustrations. After returning to the class, make a list on chart paper of the various plants and animals the students say they have drawn.

Instructional Input: Video
Ask the students why they think there are so many different plants and animals. Tell them, they will be watching a video about biodiversity. They should think about that question while watching the video.

http://mocomi.com/biodiversity/

After the video, discuss biodiversity, and ask the students why they think there are so many different plants and animals. Ask students if they think there may be even more plants and animals than they had first imagined in the school.

Model:
Using the video as your starting point, explain to the students that you will illustrate the biodiversity of an area. Start with the idea of a food chain, and bridge it to the idea of a food web. Be sure to include plants as well as animals in the food web. Make sure to add labels, words, phrases, etc.

Independent Activity:
Tell students that they are now going to create a biodiversity illustration using the information they have gathered on the brief nature walk. Allow student to work on their illustrations for about 15-20 minutes.

Closing:
Select a couple of students to share their illustrations. Have them describe their area, and the plants and animal life they found there. Have one student from each area share with the group.
Discussion questions:

- Do all areas have the same biodiversity?
- Do you think that there are more species in one area than in another?
- Why? Or Why Not?

Guide responses if needed to highlight the idea that there are different amounts of life in

different areas. Have them note that in areas where there have been the most human disturbance, there is less biodiversity. Tell them, they will be taking a closer look at the biodiversity of the school later.

Lesson 2:
Discovering Biodiversity

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Lesson Rational: This lesson is intended to allow students to understand the purpose behind the Bioblitz, by having them answer the question: How can we determine the biodiversity of a region?

Objectives: The students will be able to decide the best way to determine the biodiversity of an area, and figure out what they need to know in order to conduct a successful inventory. They will also gain practice in using the iNaturalist app. Student will also understand the idea of inference and observation.

Time: 50-60 minutes

Standards Addressed:

Common Core Standards:

Materials:
- Science journals/ writing journal
- Computers
- Pencils
- iPad/other device with iNaturalist on it, 1 for every 5-7 students

Standards:

Topic	Unity and Diversity
Benchmark SC.4.5.2	Describe the roles of various organisms in the same environment

Topic	Scientific Knowledge
Benchmark SC.4.1.2	Differentiate between an observation and an inference

Speaking and Listening	Comprehension and Collaboration	4.SL.1	Engage effectively in a range of collaborative discussions (one-on-one. in groups, and teacher-led)with diverse partners on grade 4 topics and texts, building on others' ideas and expressing their own clearly.

a. Come to discussions prepared. having read or studied required material; explicitly draw on that preparation and other information known about the topic to explore ideas under discussion.
b. Follow agreed-upon rules for discussions and carry out assigned roles.
c. Pose and respond to specific questions to clarify or follow up on information, and make comments that contribute to the discussion and link to the remarks of others.
d. Review the key ideas expressed and explain their own ideas and understanding in light of the discussion.

Anticipatory Set:
Tell students that they are going to be scientists. In order to be a scientist, they need to heighten their skills of observation. Take them outside, and tell them to feel the area around them with all their senses, sound, sight, smell, touch, taste. Once they have looked around, have them close their eyes to experience the other senses better. Allow students to write in their notes for a few minutes (about 5 mins).

Purpose: Students till think about what they have experienced in order to connect to the idea of inference versus observation. They will also think about how to determine what types of life is found in an area.

Instructional Input: When the students are done writing about what they have experienced, the teacher takes them back to the class room and asks them if their notes today were different from what they had written about in the previous lesson. Ask them why the information for the same place could be different. Suggest that during the first experience, they thought about things, but that they might have seen. They may have inferred that there would be a certain type of animal in an area, but did not actually see it when they went outside. An inference is something that they think because of prior knowledge or assumptions. An observation is something that they actually witness. When they spent time outside today, they made observations of things around them.

Provide some quick checks by asking students to identify an inference and an observation.

Tell students that when scientists are in the field, they have to determine what types of native animals and what types of native plants are in an area. They also need to figure out about how many there are. Of these two, which of them do they think requires observation, and which do they think requires an inference? Ask students how they think scientists can find out what types of animals and plants are in an area. Guide them, if needed, into the idea that scientists need to go into the area, observe with all their senses, and take notes.

Model:
The teacher explains that in the next lesson, they will be scientists in the field. As scientists, they will need to determine what data they are collecting, how to collect in and how to present their data.

The teacher guides learning, while logging student ideas on a piece of chart paper, or on the white board.

- Considering the idea of Biodiversity, what information do they need to collect? (plants and animals)
- How can they collect the data (observations)
- How can they track their information (on a chart, in their science tablets, drawings, photographs, etc.)
    - Ask students to draw a complex object in the room (specific coffee cup, a poster on the board, etc. After a few seconds, take the object away. When they kids

protests, ask them if they think animals would stay still? Ask, what is a faster way to get the information? Photos! Mention that there is an app for that.

Introduce the iNaturalist app. Model for the students how to use the app to log information. Show students how to use the app in the classroom. Catalog the items in your immediate area.

Small group Practice:
Put students in teams of about 5-7. Have them take turns cataloging the items on their desk, in the pencil boxes, etc.

Check for Understanding: Walk around the room, and see who is having trouble with the app, who works with it well, etc. Provide guidance as needed, take note of who works well with the app, so they can be the technology people on the actual field trip.

Closing:
Ask the students if they think taking pictures and notes with the iPad was faster or slower than drawing? Which one could provide the most accurate information? Tell students they will be watching a video with more information about the upcoming field trip, and that t talks about the iNaturalist app they just played with.

Have students watch the BioBlitz video: https://youtu.be/vUjc79TSk2M

Tell students that in the next lesson, they will do a mini bioblitz at the school

Lesson 3:
Mini Blitz

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Lesson Rational: This lesson is intended to allow students to practice using the iNaturalist app, and be ready to collect reliable observations, with less problems when they are in the field.

Objectives: The students will practice using the iNaturalist app to log information into a project set up by the teacher. Students will also be able to determine the most effective way to gather information Students will also make preparations for the actual Bioblitz.

Time: 50-60 minutes

Materials:
- Science journals/ writing journal
- Computers
- Pencils
- iPad/other device with iNaturalist on it, 1 for every 5-7 students
- Plant, arthropod and bird lists for each group (see attached)

Standards:

Topic	Scientific Knowledge
Benchmark SC.4.1.2	Differentiate between an observation and an inference

Topic	Unity and Diversity
Benchmark SC.4.5.2	Describe the roles of various organisms in the same environment

Speaking and Listening	Comprehension and Collaboration	4.SL.1	Engage effectively in a range of collaborative discussions (one-on-one. in groups, and teacher-led)with diverse partners on grade 4 topics and texts, building on others' ideas and expressing their own clearly. a. Come to discussions prepared. having read or studied required material; explicitly draw on that preparation and other information known about the topic to explore ideas under discussion. b. Follow agreed-upon rules for discussions and carry out assigned roles. c. Pose and respond to specific questions to clarify or follow up on information, and make comments that contribute to the discussion and link to the remarks of others. d. Review the key ideas expressed and explain their own ideas and understanding in light of the discussion.

Anticipatory Set:
Tell students they they will be cataloging the biodiversity of the area outside. Ask them what they think would be the most effective way to catalog plants and animals. Tell them they will be working in teams. They need photos taken, names of plants logged, and plants identified. Ask students what they think the most effective way to do this is.

Purpose: Students will set up their teams for the Bioblitz and gain experience in doing an actual inventory.

Instructional Input: Show students the iNaturalist website, and allow them a few minutes to explore and look at some of the things that have been logged:

http://www.inaturalist.org/places/island-of-hawaii

Tell students that they will be adding to the iNaturalist database. Show them how to log into the project you created for the school MiniBlitz. Have them make up false names or log into the fake names you already created for them. Tell students that the things you catalog today, will show up in the project created on the site.

Model:

Project a map of the school. Explain to students that they will be conducting their miniblitz in a garden area, or other semi planted area. There will be three stages, a plant investigation stage, a bug investigation stage and an animal investigation stage. Put students in teams, and allow them to determine the best way to catalog information. If they need guidance, some ideas are:

1) One Photographer – takes pictures of the species they see, label the picture #1, 2, 3, etc
2) One Recorders – writes #1,2 ,3 etc on the paper – attempts to identify the species with prior knowledge

3) One Observation Person – writes # 1,2,3 etc on the paper – takes notes about the species, are there other species around it, living on it, etc.
4) Two counters – writes #1, 2, 3 etc on the paper - keeps count of how many of the species they come across (probably in a chart)

Small group:
Use a hula hoop to section out an area, or use reference point guides, to use as the sample areas for students to work in. Allow students about 7 minutes in each of three areas to catalog the inventory.

Afterward, have students return to the class, and have the app sync to the website. Asks students what are some things that they found, any birds? What could have made their jobs easier.
Suggestions (a list of what they might find to make identification easier, knowing the sounds to find birds, etc.)

Tell students that luckily, we have some of that information so they can prepare for the real bioblitz!

Students can use their Plant, Bird and Atrhropod lists.

Tell students that they will be able to bring these with them to the bio blitz. Ask students what might be the best way to deal with the information (perhaps have two students be the bug experts, two be the bird experts and two be the plant experts, etc. – See attached for possible role cards)

Allow students time to organize their information.

Check for Understanding: Walk around the room, and provide organizational ideas for the students, help guide their decisions. Perhaps the teacher may want to assign one person in each group to be in charge of the iPad and taking the photos.

Closing:
Tell the students you will share some of the bird sounds with them, challenge them to make some notes of what the sounds are like (chirps, whistles, pitch, long, short, etc).

Visit this site: http://www.soundshawaiian.com/birds.html

Go through some of the birds, or all of them. Let the students hear the sounds but not see the pictures initially, maybe they will be able to figure some of them out. Show them photo's of some of the less common birds and let them hear the sounds. Tell them they will need all their senses to take a proper inventory. Remind them of the things they need to bring on the field trip.